

U.S. Patent Application Serial No. 10/803,894
Amendment filed October 30, 2006
Reply to OA dated May 1, 2006

REMARKS

Claims 1-12 and 14-20 are presented for examination. Claim 13 has been cancelled. Claims 1, 9, and 15-20 have been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. The support for the claim amendments are as follows:

- Claim 1 is based on p.25, lines 25-27 (dispersion supply tank connected with an agitator through a line); p.26, lines 7-9 (outlet port of the agitator through a line); p.26, line 12-15 (internal pressure of the agitator)

The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **May 1, 2006**.

Claims 1-12 and 14-20 define a method for manufacturing polymerized toner. In particular, the claims recite a controlled agitation step in which agitation is controlled by several parameter, including an internal pressure of the agitator being controlled within the range between 0.01 and 15MPa.

Claims 1-20 are objected to because of informalities in the claim format.

In accordance with the Office Action's suggestion, claim 1 has been amended to positively recite the required steps.

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Claims 1-20 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, the Office Action found the term “throughput” and the phrase “provided quantity of the polymerizable monomer composition and the aqueous dispersion medium” in original claim 1 to be unclear.

Claim 1 has been amended to more clearly define the term “throughput” as meaning an output of fine droplets resulting from an agitation step provided for processing during the polymerizing step. In regards to the phrase “provided quantity of the polymerizable monomer composition and the aqueous dispersion medium,” this phrase has been amended to more clearly define that the “provided quantity” means a quantity provided into the dispersion supply tank prior to the agitation step.

Claims 1, 4-8, and 14-18 are rejected under 35 USC 102(e) as being anticipated by Tsuji, et al. (U.S. Patent Application Publication 2003/0224276).

Tsuji discloses a process for producing toner particles, and toner, in which prior to a polymerization step, a polymerizable monomer composition dispersed in an aqueous medium is formed into fine droplets (microscopic-order particles) by stirring under conditions of shear and dispersion for a period of time. (Tsuji, paragraph [0036]).

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The invention recited in currently amended claim 1 of the present application is significantly different from the invention disclosed by **Tsuji** in the following respects.

First, in the system shown in FIG. 5 of **Tsuji**, a polymerizable monomer composition is prepared within a container for dissolution (9). The polymerizable monomer composition within the container for dissolution (9) is then dispersed in an aqueous medium within a container for granulation (10). Particles of the polymerizable monomer composition (i.e., fine droplets of the polymerizable monomer composition in the aqueous medium) formed within the container for granulation are sent together with the aqueous medium to a polymerization container (12) through a liquid inlet port (7). (**Tsuji**, paragraph [0036]).

In other words, in the system shown in FIG. 5 of **Tsuji**, the polymerizable monomer composition containing no aqueous medium is prepared within the container for dissolution (9). The polymerizable monomer composition within the container for dissolution (9) is fed within the container for granulation (10), into which the aqueous medium has been introduced in advance, and dispersed in the aqueous medium there.

Example 1 of **Tsuji** shows that a monomer, a colorant, a charge control agent, a polar resin, and a parting agent were stirred within the container for dissolution (9) to evenly dissolve or disperse the respective materials in the monomer, and a polymerization initiator was then added to prepare a polymerizable monomer composition.

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The polymerizable monomer composition within the container for dissolution (9) is introduced into the container for granulation (10) containing an aqueous medium, and agitated for 15 minutes (peripheral velocity of the tip of a blade: 22 m/s) by a Clearmix high-speed agitator (11), thereby forming particles of the polymerizable monomer composition in the aqueous medium.

On the other hand, a dispersion with a polymerizable monomer composition dispersed in an aqueous dispersion medium is introduced into a dispersion supply tank (12) set forth in currently amended claim 1 of the present application. This dispersion is fed into an agitator (1) through a supply line (13). It is not necessary to introduce an aqueous dispersion medium into the agitator (1) in advance.

Second, in the system shown in FIG. 5 of **Tsuji**, the container for dissolution (9) and the container for granulation (10) are not joined through a circulation line. Therefore, in the system of **Tsuji**, it takes a relatively long time (15 minutes = 900 seconds) for agitation within the container for granulation to obtain a polymerized toner as small as about 7 μm in weight average particle diameter.

On the other hand, in the agitating apparatus recited in currently amended claim 1 of the present application, the outlet port (10) of the dispersing machine (1) is joined to the dispersion supply tank (12) through the circulating line (11) so as to circulate the dispersion agitated by the dispersing machine (1) to the dispersion supply tank (12). In the present invention, the number

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of circulations, θ , can be controlled to 2 or 1 (i.e., one pass) when a polymerized toner has a volume average particle diameter of about $8 \mu\text{m}$ or greater. (Specification, page 28, lines 13 to 23; Example 2). When a polymerized toner has a volume average particle diameter of about $7 \mu\text{m}$ or smaller, the number, θ , of circulations is controlled to at least 2. (Specification, page 27, lines 14 to 16; Example 1).

Third, in the system shown in FIG. 5 of **Tsuji**, the container for dissolution (9), the container for granulation (10), and the polymerization container (12) are joined in a series through respective lines (supply lines), and the interior of the container for granulation is not pressurized (10).

On the other hand, the internal pressure of the dispersing machine recited in currently amended claim 1 of the present application is controlled within the range between 0.01 and 15 MPa. The internal pressure of the dispersing machine is controlled within the above range, whereby fine droplets can be efficiently formed while inhibiting foaming due to cavitation. (Specification, page 26, lines 7 to 21).

Accordingly, the method for manufacturing a polymerized toner recited in currently amended claim 1 of the present application is patentably different from the manufacturing method of a polymerized toner disclosed in **Tsuji**.

As described above, in the system shown in FIG. 5, the interior of the agitator is not pressurized. **Tsuji** describes that the peripheral velocity of the agitator is controlled to 15 to

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40 m/s, preferably 20 to 35 m/s in the tip of the agitating blade. (Tsuji,[0045]). Tsuji discloses the peripheral velocity of the agitator, but Examples thereof only show an experimental example that agitation was conducted for 15 minutes at a peripheral velocity of 22 m/s in the tip of the blade. (*For example, see, Example 1*).

Comparative Example 1 of the present specification shows an experimental example that the agitator was operated at a peripheral velocity of 23 m/s without applying an internal pressure. The result of Comparative Example 1 is shown in Table 1. Table 1 shows that when the peripheral velocity of the agitator is made as low as 23 m/s without applying an internal pressure, the resulting polymerized toner causes fog upon printing, and is also insufficient in cleaning ability even when agitation is conducted fully.

On the other hand, according to the manufacturing method defined in currently amended claim 1 of the present application, and as shown in Examples 1 and 2, the peripheral velocity of the agitator is controlled to at least 30 m/s, an internal pressure is applied to the agitator, and the number of circulations is optionally controlled, whereby granulation can be conducted in a relatively short period of time. This achieves an unexpected result of obtaining a polymerized toner having excellent in printing density, cleaning ability and resolution, and which can markedly inhibit the occurrence of fog.

It is therefore submitted that the methods for manufacturing a polymerized toner defined by claims 1, 4-8, and 14-18 are patentably distinguishable from the cited reference, and that the rejection under 35 U.S.C 102(e) has been overcome.

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Reconsideration is respectfully requested.

Claims 1-8 and 14-20 are rejected under 35 USC 103(a) as being unpatentable over Tsuji.

Claim 13 has been cancelled.

For the reasons discussed above, the applicants submit that methods for manufacturing a polymerized toner defined by claims 1-8 and 14-20 are patentably distinguishable from the cited reference, and that the rejection under 35 U.S.C 103(a) has been overcome.

Reconsideration is respectfully requested.

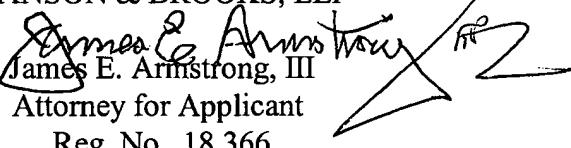
In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP

James E. Armstrong, III
Attorney for Applicant
Reg. No. 18,366

JEA/gia
Atty. Docket No. 040136
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



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